



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,432	11/28/2003	Young Hoon Kwark	YOR920030378US1	7371

48150 7590 03/29/2007
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER

BEVERIDGE, RACHEL E

ART UNIT	PAPER NUMBER
----------	--------------

1725

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/722,432

Applicant(s)

KWARK ET AL.

Examiner

Rachel E. Beveridge

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-26 and 29-32 is/are pending in the application.
- 4a) Of the above claim(s) 25 and 26 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-10, 12, 13, 15-17, 19, 20 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 6, 11, 14, 18, 21, and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 6, 2007 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7, 9, 12, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Horiuchi et al. (US 6,084,295).

With respect to claim 1, Horiuchi et al. disclose electrically connecting a semiconductor chip (10) to a connection (12) on a circuit board (5) (Horiuchi et al., column 5, lines 51-54). Horiuchi et al. teach a plurality of bonding wires (20) with conductive wire and electro-insulation coating for electrically connecting the circuit board (5) to the semiconductor chip (10) (Horiuchi et al., column 2, lines 1-9). Horiuchi et al. also disclose matching the impedance to that of a signal line by selecting the

Art Unit: 1725

insulation material (Horiuchi et al., column 5, lines 29-33). Horiuchi et al. disclose that "it is possible to make the impedance-matching as a signal line by the selection of material (dielectric constant) and/or thickness of the resin coating 32 covering the conductive wire" (Horiuchi et al., column 5, lines 29-33).

With regard to claim 2, Horiuchi et al. further teach predetermined distances between each wire and shows wires subsequently above each other in figure 1.

Regarding claim 3, Horiuchi et al. also show wires in a predetermined configuration alongside one another in figures 7(a) and 8.

With respect to claim 7, Horiuchi et al. teach the resin coating (32) to cover the bonding section and an electro-conductive resin (34) used for shielding (Horiuchi et al., column 6, lines 14-17). Figure 3 also shows an epoxy type coating (30) on a gold wire (28) to be the bond wire (20) connecting the signal between semiconductor and circuit board.

With respect to claim 9, Horiuchi et al. also show wires in a predetermined configuration alongside one another in figures 7(a) and 8.

With regard to claim 12, Horiuchi et al. figure 3 shows a round bonding wire.

Regarding claim 19, the examiner interpreted high to be any value for dielectric constant of the insulating material due to the lack of relation to a low value and lack of specified values for a high dielectric constant. Horiuchi et al. disclose matching the impedance to that of a signal line by selecting the insulation material (Horiuchi et al., column 5, lines 29-33) and that an electro-conductive resin (34) is capable of easily shielding the semiconductor chip (10) (Horiuchi et al., column 5, lines 34-37). Horiuchi

et al. also disclose the lack of risk of a short-circuit between the bonding wires (20) even though they are shielded with electro-conductive resin (34) because the electrode terminals and bonding section between the wires (20) and pads (22) are covered with electro-insulation resin (32) (Horiuchi et al., column 5, lines 37-44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7, 9-10, 12, 16, 19, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) in view of Horiuchi et al. (US 6,084,295).

With respect to claims 1-4, 8, 9-10, 12, 16, 19, 31, and 32, Grellmann et al. disclose a method of making an electronic interconnection (Grellmann et al., col. 1, lines 6-8), said method comprising: for a signal line to be interconnected, using a plurality of bonding wires configured to provide a controlled impedance effect (Grellmann et al., col. 1, lines 55-63); and a predetermined distance is maintained (Grellmann et al., col. 2, lines 13-15 and col. 3, lines 30-35) separating a first bonding wire and a second bonding wire of said plurality of bonding wires to provide at least a part of said controlled impedance effect (Grellmann et al., col. 3, lines 37-41 and 56-61). Grellmann et al. also disclose said plurality of bonding wires is configured such that a first bonding

Art Unit: 1725

wire is located a predetermined distance above a second bonding wire to provide at least a part of said controlled impedance effect (Grellmann et al., col. 3, lines 36-41 and 54-61). Grellmann et al. disclose said plurality of bonding wires is configured such that a first bonding wire is located a predetermined distance alongside a second bonding wire to provide at least a part of said controlled impedance effect (Grellmann et al., col. 3, lines 30-35 and col. 4, lines 11-18). Furthermore, Grellmann et al. disclose one of a first bonding wire and a second bonding wire of said plurality of bonding wires is grounded (Grellmann et al., see for example col. 3, lines 4-26 for the first layer of bonding wires). Grellmann et al. disclose a third bonding wire located a predetermined distance alongside said first bonding wire and said second bonding wire (Grellmann et al., see figure 1 showing three bonding wires in each layer; for example see contact points for the first layer where contact points 30a-c are for three wires of the first layer at contact on the hybrid (10) and contact points 32a-c are for three wires of the first layer at contact with IC die (12)). Grellmann et al. also disclose co-dispensing (utilizing a "programmable automatic wire bonding machine capable of maintaining a distance between adjacent contact points") bonding wires of said plurality of bonding wires (Grellmann et al., col. 5, lines 3-8). Grellmann et al. disclose said bonding wires of said signal line comprise a plurality of round bonding wires (Grellmann et al., col. 4, lines 25-28); and said plurality of bonding wires for said signal comprise a coplanar waveguide (Grellmann et al., col. 3, lines 6-12 and see figure 1). Moreover, Grellmann et al. disclose both a signal current and a return current are conducted by said plurality of bonding wires (Grellmann et al., col. 1, lines 55-60 and 64-67); and said controlled

Art Unit: 1725

impedance effect results from an electromagnetic coupling amongst the bonding wires in said plurality of bonding wires for said signal line (Grellmann et al., col. 2, lines 4-15, 29-32, and 37-40). However, Grellmann et al. lack disclosure of a dielectric material separating the bonding wires and providing at least part of said controlled impedance effect. Horiuchi et al. disclose a dielectric material such that a predetermined distance is maintained by said dielectric material separating a first bonding wire and a second bonding wire of said plurality of bonding wires (Horiuchi et al., col. 2, lines 10-13; col. 5, lines 28-44; and col. 6, lines 50-57). Horiuchi et al. also suggests that the dielectric material provides at least part of a controlled impedance effect because Horiuchi et al. dielectric material helps to maintain the positions and pitch of the wires and the configuration of the wires controls the effects of impedance. Horiuchi et al. also disclose said dielectric material is continuously placed along a length of said plurality of bonding wires (Horiuchi et al., col. 6, lines 14-17 and figure 3). Horiuchi et al. disclose said dielectric material including particles having a high dielectric constant (Horiuchi et al., column 5, lines 29-44), where the examiner interpreted high to be any value for dielectric constant of the insulating material due to the lack of relation to a low value and lack of specified values for a high dielectric constant. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the electronic interconnection of Grellmann et al. to include the dielectric material of Horiuchi et al. in order to shield the bonding wires at points of contact and enhance the heat dissipation from the semiconductor chip without risking a short-circuit between bonding wires (Horiuchi et al., col. 5, lines 15-22 and 42-44).

With respect to claims 29-30, Grellmann et al. disclose a method of providing a signal from a chip, said method comprising: for a signal of said chip, providing a controlled impedance signal line comprising plurality of bonding wires configured to be separated by a predetermined distance (Grellmann et al., col. 1, lines 55-63); said controlled impedance being designed to be near in a value to at least one of an impedance of a circuit of said chip and an impedance of a circuit to which said signal line is interconnecting said chip circuit (Grellmann et al., col. 1, lines 55-63; col. 2, lines 1-36; and col. 3, lines 56-61); and said controlled impedance being determined by said predetermined distance (Grellmann et al., col. 2, lines 13-15 and col. 3, lines 30-35, 37-41, and 56-61). Grellmann et al. also disclose said plurality of bonding wires are arranged in one of a microstrip configuration or a coplanar waveguide configuration (Grellmann et al. disclose a coplanar waveguide configuration, see figure 1 and col. 3, lines 6-12). However, Grellmann et al. lack disclosure of a dielectric material separating the bonding wires and controlled impedance effect being determined by a dielectric constant of said dielectric material. Horiuchi et al. disclose a dielectric material such that a predetermined distance is maintained by said dielectric material (Horiuchi et al., col. 2, lines 10-13; col. 5, lines 28-44; and col. 6, lines 50-57). Horiuchi et al. disclose said dielectric material including particles having a high dielectric constant (Horiuchi et al., column 5, lines 29-44), where the examiner interpreted high to be any value for dielectric constant of the insulating material due to the lack of relation to a low value and lack of specified values for a high dielectric constant. Thus, Horiuchi et al. suggests that the dielectric material provides at least part of a controlled impedance effect because

Horiuchi et al. dielectric material helps to maintain the positions and pitch of the wires and the configuration of the wires controls the effects of impedance. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the electronic interconnection of Grellmann et al. to include the dielectric material of Horiuchi et al. in order to shield the bonding wires at points of contact and enhance the heat dissipation from the semiconductor chip without risking a short-circuit between bonding wires (Horiuchi et al., col. 5, lines 15-22 and 42-44).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Chia et al. (US 2004/0182911 A1).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 1. Horiuchi et al. also teach epoxy as insulation but lack disclosure of the type of epoxy used. Chia et al. teach wire bonding utilizing an insulating liquid (112), more specifically using ultra-violet light-cured epoxies (Chia et al., p. 1, [0021], lines 3-4). Therefore, it would have been obvious to one of ordinary skill the art at the time of the invention to modify the wire bonding method of Horiuchi et al. to utilize the ultra-violet light-cured epoxy of Chia et al. in order to electrically insulate the bonding wires and attach them to the package in any desired sequence without causing package defects (Chia et al., p. 2, [0026], lines 3-7).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) and Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Chia et al. (US 2004/0182911 A1).

The teachings of Grellmann et al. and Horiuchi et al. are the same as relied upon in the rejection of claim 1. Horiuchi et al. also teach epoxy as insulation but both Grellmann et al. and Horiuchi et al. lack disclosure of the type of epoxy used. Chia et al. teach wire bonding utilizing an insulating liquid (112), more specifically using ultra-violet light-cured epoxies (Chia et al., p. 1, [0021], lines 3-4). Therefore, it would have been obvious to one of ordinary skill the art at the time of the invention to modify the combined invention of Grellmann et al. and Horiuchi et al. to utilize the ultra-violet light-cured epoxy of Chia et al. in order to electrically insulate the bonding wires and attach them to the package in any desired sequence without causing package defects (Chia et al., p. 2, [0026], lines 3-7).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Steranko et al. (US 3,840,169).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 1. Horiuchi et al. also teach dispensing wires for bonding but lack disclosure of co-dispensing a plurality of bonding wires. Steranko et al. disclose bonding multiple wires to a circuit board continuously (Steranko et al., abstract, lines 1-9) as shown in figure 1. It would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the wire bonding method of Horiuchi et al. to include the co-dispensing apparatus of Steranko et al. in order to have strong bonding of multiple wires at one time (Steranko et al., col. 1, lines 40-44).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) and Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Steranko et al. (US 3,840,169).

The teachings of Grellmann et al. and Horiuchi et al. are the same as relied upon in the rejection of claim 1. Grellmann et al. also disclose dispensing (utilizing a "programmable automatic wire bonding machine capable of maintaining a distance between adjacent contact points") bonding wires of said plurality of bonding wires (Grellmann et al., col. 5, lines 3-8), and Horiuchi et al. teach dispensing wires for bonding. However, both Grellmann et al. and Horiuchi et al. lack specific disclosure of "co-dispensing" a plurality of bonding wires. Steranko et al. disclose bonding multiple wires to a circuit board continuously (Steranko et al., abstract, lines 1-9) as shown in figure 1. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Grellmann et al. and Horiuchi et al. to include the co-dispensing apparatus of Steranko et al. in order to have strong bonding of multiple wires at one time (Steranko et al., col. 1, lines 40-44).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Lee (US 2001/00154900 A1).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 1. Horiuchi et al. also disclose bonding a plurality of bonding wires for signal transmission between and semiconductor chip (10) and a circuit board (5). However, Horiuchi et al. lack bonding a plurality of ribbon wires in the package. Lee teaches ribbon bonding wire for signal transmission (Lee, p. 3, [0031], lines 3-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the wire bonding method of Horiuchi et al. to include the bonding of ribbon bonding wire between the chip and circuit board of Lee in order to model transverse distribution adequately and utilize a wire-grid method to understand the influence of material during signal transmission (Lee, p. 3, [0031], lines 6-10, and [0030], lines 4-6).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) and Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Lee (US 2001/00154900 A1).

The teachings of Grellmann et al. and Horiuchi et al. are the same as relied upon in the rejection of claim 1. Horiuchi et al. also disclose bonding a plurality of bonding wires for signal transmission between and semiconductor chip (10) and a circuit board (5). However, both Grellmann et al. and Horiuchi et al. lack bonding a plurality of ribbon wires in the package. Lee teaches ribbon bonding wire for signal transmission (Lee, p.

Art Unit: 1725

3, [0031], lines 3-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Grellmann et al. and Horiuchi et al. to include the bonding of ribbon bonding wire between the chip and circuit board of Lee in order to model transverse distribution adequately and utilize a wire-grid method to understand the influence of material during signal transmission (Lee, p. 3, [0031], lines 6-10, and [0030], lines 4-6).

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Notani et al. (US 5, 924,897).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 1. However, Horiuchi et al. lack specific description of the bonding wires to comprise a microstrip. Notani et al. disclose a transmission line having a microstrip line structure (Notani et al., col. 7, lines 1-2). It is understood that a microstrip transmits a single-ended signal as disclosed by the applicant. Notani et al. disclosure of a transmission line having a microstrip structure (Notani et al., col. 7, lines 1-2) satisfies a single-ended signal. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the wire bonding method of Horiuchi et al. to include the disclosed microstrip of Notani et al. in order to arrange the strip signal conductor opposite a ground conductor on the dielectric (Notani et al., col. 7, lines 2-3).

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) and Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Notani et al. (US 5, 924,897).

The teachings of Grellmann et al. and Horiuchi et al. are the same as relied upon in the rejection of claim 1. However, Grellmann et al. and Horiuchi et al. lack specific description of the bonding wires to comprise a microstrip. Notani et al. disclose a transmission line having a microstrip line structure (Notani et al., col. 7, lines 1-2). Furthermore, it is understood that a microstrip transmits a single-ended signal as disclosed by the applicant. Notani et al. disclosure of a transmission line having a microstrip structure (Notani et al., col. 7, lines 1-2) satisfies a single-ended signal. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Grellmann et al. and Horiuchi et al. to include the disclosed microstrip of Notani et al. in order to arrange the strip signal conductor opposite a ground conductor on the dielectric (Notani et al., col. 7, lines 2-3).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 19 above, and further in view of Kurtz et al. (US 4,555,052).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 19. The examiner interpreted high to be any value for dielectric constant of the insulating material due to the lack of relation to a low value and lack of specified values for a high dielectric constant. Horiuchi et al. lack disclosure of the particular material

Art Unit: 1725

comprising the dielectric. However, Kurtz et al. discloses ceramic as a dielectric material useful for electric insulation (Kurtz et al., col. 6, lines 52-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the wire bonding method of Horiuchi et al. to include the ceramic dielectric of Kurtz et al. in order to properly bond the wire for transmission while the package is grounded (Kurtz et al., col. 6, lines 47-52).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grellmann et al. (US 4,686,492) and Horiuchi et al. (US 6,084,295) as applied to claim 19 above, and further in view of Kurtz et al. (US 4,555,052).

The teachings of Grellmann et al. and Horiuchi et al. are the same as relied upon in the rejection of claim 19. The examiner interpreted high to be any value for dielectric constant of the insulating material due to the lack of relation to a low value and lack of specified values for a high dielectric constant. Both Grellmann et al. and Horiuchi et al. lack disclosure of the particular material comprising the dielectric. However, Kurtz et al. discloses ceramic as a dielectric material useful for electric insulation (Kurtz et al., col. 6, lines 52-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Grellmann et al. and Horiuchi et al. to include the ceramic dielectric of Kurtz et al. in order to properly bond the wire for transmission while the package is grounded (Kurtz et al., col. 6, lines 47-52).

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) as applied to claim 1 above, and further in view of Grellmann et al. (US 4,686,492).

The teachings of Horiuchi et al. are the same as relied upon in the rejection of claim 1. However, Horiuchi et al. lack specific disclosure of both a signal current and a return current conducted by the plurality of bonding wires, and specific disclosure of the controlled impedance effect resulting from electromagnetic coupling amongst the bonding wires. Grellmann et al. disclose a method for solving the inductive problem posed by wire bond connection in a configuration that essentially preserves the approximate predetermined impedance of the transmission line (Grellmann et al., col. 1, lines 55-60). Grellmann et al. also disclose a plurality of substantially co-planar layers of bond wires, each layer, comprising a signal-carrying line flanked on both sides thereof by a ground line (Grellmann et al., col. 1, lines 64-67); thus, Grellmann et al. configuration of each signal line contains both signal and return currents. Furthermore, Grellmann et al. disclose the adjacent parallel layers being capacitive in order to compensate for the fundamentally inductive nature of the bond wire connection (Grellmann et al., col. 2, lines 4-15), and the impedance is therefore lower because the capacitance provided by the second bond wire layer (the configuration of the bonding wires) compensates for the inductive loading created by the first layer (Grellmann et al., col. 2, lines 29-32 and 37-40). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Horiuchi et al. to include the bonding wire configuration for controlling the impedance effect in the signal line of

Art Unit: 1725

Grellmann et al. in order to provide an electrical connection between two electrical device utilizing conventional wire bonding techniques where the impedance of the wire bond matches the output/input impedances of the two electrical devices respectively (Grellmann et al., col. 2, lines 44-49).

Allowable Subject Matter

Claims 6, 11, 14, 18, 21, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claim 11, the following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest either alone or in combination all of the features of independent claim and dependent claim 11, more particularly including co-dispensing a dielectric material with said bonding wires.

Claims 23 and 24 are allowed.

The following is an examiner's statement of reasons for allowance:

With regard to claim 23, the prior art of record does not teach or suggest either alone or in combination all of the features of claim 23, more particularly including a dielectric material co-dispensed with said plurality of bonding wires.

With regard to claim 24, the prior art of record does not teach or suggest either alone or in combination all of the features of claim 24, more particularly including a dielectric material co-dispensed with said plurality of bonding wires.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

For all arguments filed with the amendment on February 6, 2007, in particular arguments with regard to the rejections made final on December 6, 2006, the examiner notes the response of record by the examiner in the advisory action mailed on February 21, 2007. The examiner noted previously as irrelevant due to the fact that Grellmann et al. was not cited for any claims other than dependent and new claims 31 and 32. However, in view of the applicant's own admission of the relevance of Grellmann et al., the reference was re-examined with regard to all of the instant claims (including previously allowed claims). The examiner understands all of applicant's arguments regarding the lack of teaching within Grellmann et al. for certain features of applicant's claims (particularly independent claim 1); however, these arguments are moot in view of the new claim rejections above.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is 571-272-5169. The examiner can normally be reached on Monday through Friday, 9 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

reb
March 23, 2007



JONATHAN JOHNSON
PRIMARY EXAMINER